CLAIMS

1. A micro-electro-mechanical systems (MEMS) accelerometer comprising a wafer micro-fabricated to provide frame defining an opening, a sensing mass disposed within the opening of the frame and connected to the frame by a pair of aligned pivot beams disposed so that the axis of pivoting of the mass with respect to the frame is displaced from the centre of gravity of the mass, and at least one sensing beam connecting the mass to the frame and arranged such that pivoting movement of the mass will distort the sensing beam, whereby pivoting movement of the mass may be detected by sensing the distortion of the sensing beam.

2. A MEMS accelerometer as claimed in claim 1, wherein the mass is connected to the frame by two sensing beams extending from opposed sides of the mass to the frame whereby the sensing beams are distorted in opposite senses upon the mass performing pivoting movement.

3. A MEMS accelerometer as claimed in claim 1 or claim 2, wherein the frame, the mass, the pivoting beams and the or each sensing beam are all produced from a single wafer of semiconductor material by micro-electro-mechanical systems techniques.

4. A MEMS accelerometer as claimed in claim 3, wherein at least the or each sensing beam is of or carries piezo-electric material whereby the distortion thereof may be detected by determining a change in the electrical characteristics of the or each sensing beam.

5. A MEMS accelerometer as claimed in any one of claims 1 to 3, wherein the or each sensing beam includes implanted or deposited metallic components whereby the distortion of the or each beam may be detected by determining a change in the electrical characteristics thereof.

6. A MEMS accelerometer as claimed in claim 2 or any claim dependent thereon, wherein the sensing beams are co-planar and extend substantially co-linearly in opposite directions away from opposed sides of the mass to the frame.

7. A MEMS accelerometer as claimed in any of the preceding claims, wherein the mass has the general shape of a cuboid and the sensing beams extend from a face thereof to the frame.

8. A MEMS accelerometer as claimed in claim 7, wherein the pivot beams are disposed substantially centrally of the face from which the beams extend, the pivot axis extending transversely across that face.

9. A MEMS accelerometer as claimed in claim 8, wherein the pivot axis of the pivot beams is at or adjacent to said face of the mass from which the sensing beams extend.

10. A MEMS accelerometer as claimed in any of claims 7 to 9, wherein the sensing beams have a substantially rectangular profile, in the plane of the face of the mass from which the beams extend.

11. A MEMS accelerometer as claimed in any of the preceding claims, wherein the or each sensing beam and the pivot beams are substantially co-planar when the accelerometer is at rest.

12. A MEMS accelerometer as claimed in any of the preceding claims, wherein the frame defines two openings in each of which is provided similar mass, mounted in the opening by a respective pair of pivot beams and one or more respective sensing beams.

13. A MEMS accelerometer as claimed in claim 12, wherein the respective pairs of sensing beams are substantially co-planar but the respective pairs of pivot beams are substantially orthogonal whereby the two accelerometers sense acceleration in orthogonal directions.

14. A MEMS accelerometer as claimed in claim 12 or claim 13, wherein the frame defines a third opening and a third mass is disposed within the third opening, the sensing axis of the third mass being substantially orthogonal to the sensing axes of the first and second masses.

15. A MEMS accelerometer as claimed in claim 14, wherein the third mass is supported on one or more sensing beams.

16. A MEMS accelerometer as claimed in any claim 15, wherein the third mass is supported by four sensing beams extending in two directions orthogonal to each other.

17. A MEMS accelerometer as claimed in claim 16, wherein the third mass has the general shape of a cuboid and the four sensing beams extend respectively from each of the four edges of a face of the third mass to the frame.

18. A MEMS accelerometer as claimed in claim 17, wherein the four sensing beams associated with the third mass are substantially co-planar with the sensing beams of the other two masses.